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REMARKS

Claims 1-52 are currently pending in the subject application and are presently under consideration. Furthermore, it appears as though the Examiner has introduced new statutory grounds for the rejection of claims 1-7, 13-28, 30-34, 38-46 and 48-52 that was not necessitated by amendments to the claims. In particular, at page 3 of the Final Office Action (dated June 30, 2005), the Examiner concedes that the reference does not disclose all the claim limitations, but introduces a secondary reference the Examiner alleges cures this deficiency (i.e., "*Voth in view of Kuribayashi discloses the capability to transmit time synchronization information and non time synchronization data over an interconnected network*"). The Examiner is impermissibly employing the teachings of two references to reject the aforementioned claims under 35 U.S.C. §102. Accordingly, applicants' representative requests the Examiner withdraw this rejection, or cast the rejection under the proper statutory grounds so that applicants' representative can make a consistent response to the Examiner's rejection. Additionally, since the new grounds for rejection were not based upon claim amendments, the finality of this Office Action should be withdrawn.

Favorable reconsideration of the subject patent application is respectfully requested in view of the comments herein.

I. Rejection of Claims 1-7, 13-28, 30-34, 38-46 and 48-52 Under 35 U.S.C. §102(e)

Claims 1-7, 13-28, 30-34, 38-46 and 48-52 stand rejected under 35 U.S.C. §102(e) as being anticipated by Voth (US Patent No. 6,199,169). It is respectfully submitted that this rejection should be withdrawn for at least the following reasons. Voth does not teach or suggest each and every element of applicants' invention as set forth in the subject claims. Moreover, the Examiner relies upon the teachings of a secondary reference to show the teachings of Voth anticipate the subject claims without establishing that the teachings from the secondary reference are inherent in Voth. Accordingly, a 35 U.S.C. §102 rejection is improper, and a subsequent §103 rejection employing the same references is also impermissible because Voth is neither in the field of applicants' endeavor, nor reasonable pertinent to the particular problems with which the applicants' are concerned.

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A single prior art reference anticipates a patent claim only if it expressly or inherently describes *each and every limitation set forth in the patent claim*. *Trintec Industries, Inc., v. Top-U.S.A. Corp.*, 295 F.3d 1292, 63 U.S.P.Q.2d 1597 (Fed. Cir. 2002); *See Verdegall Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). *The identical invention must be shown in as complete detail as is contained in the ... claim*. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989) (emphasis added).

Applicants' claimed invention relates generally to industrial control systems with a time synchronization apparatus for synchronizing operation of a first controller with that of a second controller. More specifically, the invention discloses a system comprising distinct components, each with explicit structural interrelationships with other components: 1) either a processor interface or a backplane bus in a control chassis, 2) a synchronization apparatus, 3) a host processor, 4) a network in the control system, and 5) a second controller. For example, the host processor is structurally interrelated with the synchronization apparatus by a processor interface (or a backplane bus as in claim 38). Similarly, the host processor is structurally interrelated with the second controller by a network in the control system. Moreover, the processor interface (or backplane bus) is distinct from the network in the control system because the former is a structural interface between a synchronization apparatus and a host processor, while the latter is a structural interface between the host processor and the second processor. In particular, independent claim 1 (and similarly independent claims 38 and 39) recites, "a *second controller* ... a *processor interface* for interfacing the *synchronization apparatus* with a *host processor* ... and ... a *network* in the control system". Additionally, independent claim 1 (and similarly independent claims 38, 39 and 52) recites, "a transmitter adapted to transmit *synchronization information and data* to a network in the control system". Voth does not teach or suggest these novel features.

Rather, Voth relates to a method of time synchronization in a computer cluster system. (See Abstract). The system includes a master node and a plurality of slave nodes, interconnected via a computer network. (See FIG. 1; col. 4, ll. 7-17). Voth teaches three of the five distinct components of the subject claims, but is silent with respect to the other two components, and silent with respect to the structural interrelationships between the components. The Examiner

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tacitly ignores this shortcoming by citing a single component in Voth to represent multiple distinct components of the subject claims, even though by doing so, the Examiner has destroyed the claimed structural interrelationship between the distinct components. For example, with reference to FIG. 1 of Voth, the Examiner contends that the entire system 100 is a synchronization apparatus. (See Final Office Action, page 2). In addition, the Examiner suggests that Voth's master node 102a is a host processor, any one of the slave nodes 102b-d is a second controller, and the network 104 is both a network in the control system and a processor interface (or a backplane bus). Hence, it is the Examiner's position that Voth teaches a synchronization apparatus that *contains* a host processor and therefore she (ostensibly) need not establish that the synchronization apparatus is *interfaced* with a host processor by a processor interface.

In essence, the Examiner is taking each component *in isolation*, and then citing a component from Voth that, in isolation, can be characterized as similar, but entirely without regard to the claimed interrelationships with the other components. For example, if, as the Examiner interprets, the system 100 is a synchronization apparatus, then the master node 102a (host processor) and the network 104 (processor interface) are constituents of the system 100, not distinct components that are structurally related to the system 100. Therefore, Voth fails to teach or suggest *a processor interface for interfacing the synchronization apparatus [the system 100] with a host processor* because the system 100 of Voth does not interface with a host processor, nor does it do so *via* a processor interface. Rather, the system 100 may have a host processor, but it does not teach or suggest the host processor of the subject claims because the host processor in Voth is internal to the system 100, not interfaced to the system 100 *via* a processor interface.

Voth does not teach or suggest, nor does the Examiner argue, that they system 100 is interfaced with anything, let alone a host processor. Rather, the Examiner relies on a showing that the system 100 contains a host processor, not that the system 100 is interfaced to a host processor. Moreover, Voth teaches that the network 104 interfaces the master node 102a to slave nodes, not, as in the subject claims, interfacing the synchronization component with the host processor. Again, the Examiner is attempting to demonstrate that the system 100 contains an interface, but nothing more. Hence, Voth does not disclose the identical invention in as complete detail as in the subject claims, and this rejection should be withdrawn.

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Applicants' claimed invention further relates to a synchronization module in a control chassis for synchronizing operation of a first controller in the control chassis with that of a second controller *outside the control chassis*. In particular, independent claim 38 recites, "A synchronization module in a control chassis for synchronizing operation of a first controller in the control chassis with that of a second controller *outside the control chassis*, comprising: a host processor in communication with the first controller *via a backplane bus in the control chassis*; a transmitter adapted to transmit synchronization information and data to *a network in the control system*". Voth does not teach or suggest each and every feature of the subject claim.

In particular, Voth teaches only a means by which the constituents of the system 100 can communicate with other constituents, *i.e.*, the network 104, whereas the instant claim of the subject invention recites distinct components with distinct structural interrelationships by which communication is possible (*e.g.*, a backplane bus and a network in the control system). The Examiner indicates that the network 104 is the backplane bus in the control chassis. (*See* Final Office Action, page 9). Therefore, Voth does not teach or suggest transmitting synchronization information and data to *a network in the control system*. Voth is silent as to whether the network 104 (*i.e.*, the backplane bus in the control chassis) can communicate with anything outside of the system 100, let alone a second controller *outside the control chassis*.

Applicants' claimed invention further relates to a synchronization circuit for synchronizing operation of a first controller with that of a second controller in a control system. In particular, independent claim 39 (and similarly independent claim 52) recites, "the synchronization circuit is *configurable by the host processor* to operate as one of a synchronization master and a synchronization slave." Voth does not teach or suggest these novel features. Rather, Voth teaches that one of the nodes assumes a master role and the remaining nodes function as slaves (*see* col. 4, ll. 37-39), but the reference is silent regarding whether the nodes are *configurable by the host processor*. Accordingly, Voth does not teach or suggest the synchronization circuit is *configurable by the host processor* to operate as one of a synchronization master and a synchronization slave.

Moreover, independent claim 1 (and similarly independent claims 38, 39 and 52) recites, "a transmitter adapted to transmit *synchronization information and data* to a network in the control system", whereas Voth discloses a system to transmit synchronization information, but not synchronization information and data. At page 3 of the Final Office Action, the Examiner

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concedes that the reference does not disclose these claim limitations, but introduces a secondary reference the Examiner alleges cures this deficiency (i.e., "*Voth in view of Kuribayashi discloses the capability to transmit time synchronization information and non time synchronization data over an interconnected network*"). In order to maintain this rejection, the Examiner must establish that the teachings found in Kuribayashi are inherent described in Voth, but the Examiner has not made such a demonstration.

"To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (quoting *Continental Can co. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991)). "Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Mehl/Biophile Int'l Corp. v. Milgraum*, 192 F.3d 1362, 1365, 52 USPQ2d 1303, 1305 (Fed. Cir. 1999), reh'g denied, 1999 U.S. App. LEXIS 31386 (Fed. Cir. Oct. 27, 1999) (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)).

The Examiner has not even suggested that the indicated teachings of Kuribayashi are inherent in Voth let alone attempted to incorporate this suggestion in her arguments. Rather, the Examiner points out "Voth discloses a system that is capable of performing a particular single purpose, which is time synchronization." (See Final Office Action, page 2). Accordingly, Voth does not teach or suggest the capability to transmit synchronization information and data such as e.g., control data described in the specification portion of applicants' disclosure at e.g., page 19, line 12. In contrast, Voth teaches a particular, single type of information transmitted, which is time synchronization information. Pursuant to *Milgaum*, inherency may not be established by possibilities...the mere fact that the system disclosed in Voth may transmit data as well as time synchronization information is not sufficient to establish inherency

Accordingly, the Examiner has relied upon the teachings of more than a single reference to rejection the subject claims, but has not shown or even declared that the secondary reference was employed to show inherency. In view of at least the above, it is apparent Voth does not

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disclose or suggest the subject invention as described in independent claims 1, 38, 39 and 52 as well as the associated dependent claims. Accordingly, this rejection should be withdrawn.

II. Rejection of Claims 8-12 Under 35 U.S.C. §103(a)

Claims 8-12 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Voth (US Patent No. 6,199,169) in view of Ramussen, *et al.* (US Patent No. 6,449,732). Withdrawal of the rejection is respectfully requested because Voth and Ramussen, *et al.*, either alone or in combination, fail to teach or suggest the applicants' claimed invention. In addition, Voth is directed toward non-analogous art and is therefore not reasonably pertinent to be relied upon as a basis for rejection.

Claims 8-12 depend directly or indirectly upon independent claim 1. As noted *supra*, Voth does not teach or suggest applicants' invention recited in the subject claims. Ramussen, *et al.* fails to make up for the aforementioned deficiencies of Voth and this rejection should be withdrawn.

Moreover, Voth is non-analogous art. "In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned." *In re Oetiker*, 977 F.2d 144, 1446, 24 USPQ2d 1443, 1445 (Fed. Cir. 1992). See also *In Re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986); *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). Voth relates to a method of synchronization, however, this method is very limited because it works in a Single System Image (SSI) computer cluster (*see* col. 4, ll. 35-38) and requires a very high speed network (*see* col. 4, ll. 19-22), whereas the subject invention can operate with industrial controllers in a distributed control system network. For example, in Voth, the maximum round-trip time of a SYNC message sent from the master to the slave and back to the master is assumed to be no more than 1 microsecond (*i.e.*, 1 μ s). (*See* col. 8, ll. 44-56). While this round-trip time of 1 μ s is exemplary, and other values are contemplated (up to 5 μ s; *see* col. 8, ll. 64-66), the precision of the synchronization algorithm is proportionate to the speed of the network. (*See* col. 8, ll. 57-58).

In order to affect synchronization, the round-trip time for a SYNC message must be less than half of a clock tick, where a clock tick is taught to be 10 μ s. (*See* col. 8, ll. 60-66). The synchronization algorithm effectively treats the propagation time (*i.e.*, latency) between the

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nodes as zero when synchronizing, which is why the round-trip time must be extremely fast or about $1\mu\text{s}$, and also why this method applies only to SSI computer clusters or similar systems with very high speed networks of a particular topology. The reference will not work in conventional networks in a control system or with controllers that communicate with other controllers outside the time zone or outside the first control chassis. For Example, the latency between the controllers can be on the order of $50\mu\text{s}$ (producing a $100\mu\text{s}$ round-trip time), which is about 20 times too imprecise to affect synchronization using the method disclosed in Voth. Moreover, Voth cannot function in topologies other than a star topology wherein all slave nodes are directly connected to the master node, whereas conventional networks in a control system assume many topologies, such as a daisy-chain and ring topologies. In various other topologies, the round-trip time to communicate from the master to all slave nodes and back can be on the order of 1200 milliseconds, which is about 240,000 times too imprecise to affect synchronization by employing the method of Voth. Moreover, Voth relies upon inherent operating system calls such as the UNIX SYNC message, whereas typical controllers in a control system are not installed with full-service operating systems intended for commercial use. As such, Voth cannot function within conventional industrial control system network environments, and is therefore not "reasonably pertinent to the particular problem with which the inventor was concerned."

III. Rejection of Claims 29, 35-37 and 47 Under 35 U.S.C. §103(a)

Claims 29, 35-37 and 47 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Voth (US Patent No. 6,199,169) in view of Kuribayashi, *et al.* (US Patent No. 6,775,246). Withdrawal of the rejection is respectfully requested for at least the following reasons. Voth and Kuribayashi, *et al.*, alone or in combination, do not teach or suggest the applicants' claimed invention. Furthermore, Voth relates to non-analogous art and cannot be relied upon as a basis for rejection.

Claims 29 and 35-37 depend directly or indirectly upon independent claim 1 while claim 47 depends directly or indirectly upon independent claim 39. As noted *supra*, Voth fails to teach or suggest applicants' invention as recited in the subject claims. Kuribayashi, *et al.* fails to make up for the aforementioned deficiencies of Voth with respect to independent claims from which claims 29, 35-37 and 47 depend, respectively. Moreover, as submitted *supra* with respect to the

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rejection of claims 8-12, Voth is non-analogous art, and as such cannot be used as a basis for rejection. Accordingly, this rejection should be withdrawn.

Conclusion

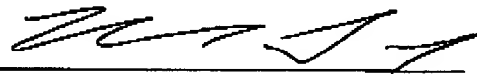
The present application is believed to be in condition for allowance in view of the above comments. A prompt action to such end is earnestly solicited.

In the event any fees are due in connection with this document, the Commissioner is authorized to charge those fees to Deposit Account No. 50-1063 [ALBRP228US].

Should the Examiner believe a telephone interview would be helpful to expedite favorable prosecution, the Examiner is invited to contact applicants' undersigned representative at the telephone number below.

Respectfully submitted,

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